

MicroSilver HyProtect coating to combat methicillin-resistant *Staphylococcus aureus* implant-associated infections

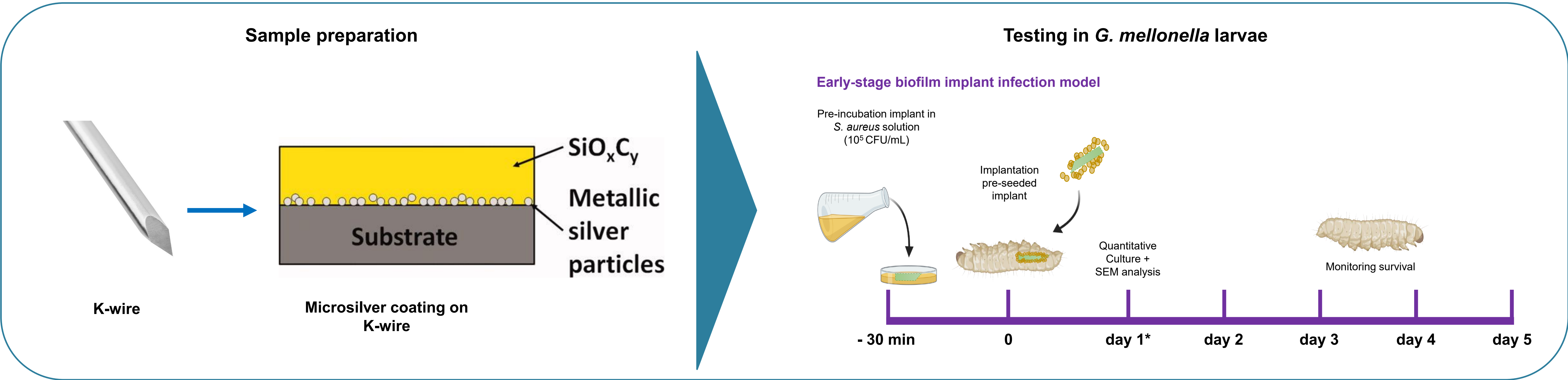
Gopala Krishna Mannala¹ Martijn Riool¹, Volker Alt¹

¹Department of Trauma Surgery, University Medical Centre Regensburg, Franz-Josef-Strauß-Allee 11, 93053 Regensburg, Germany

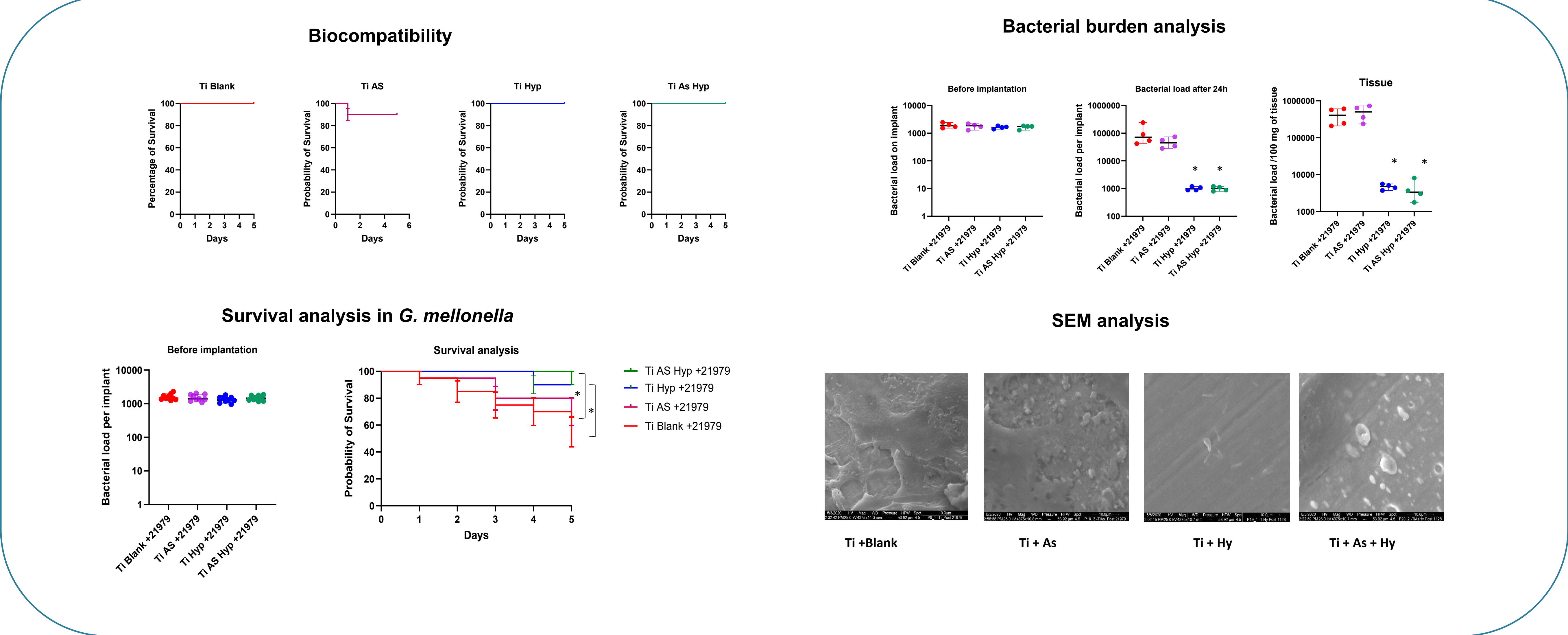
INTRODUCTION

- ❖ Implant-associated infections (IAIs) remain a major complication in orthopaedic and trauma surgery, contributing to prolonged hospitalization, repeated surgical interventions, and increased healthcare costs worldwide.
- ❖ Despite advances in aseptic techniques and perioperative antibiotic prophylaxis, infection rates associated with metallic implants remain clinically relevant.
- ❖ Surface modification of implants with antimicrobial coatings has emerged as a promising approach to reduce bacterial adhesion and biofilm formation.
- ❖ In this study, we evaluated the biocompatibility and antimicrobial efficacy of Microsilver HyProtect coatings applied to titanium K-wires using a *Galleria mellonella* infection model with methicillin-resistant *Staphylococcus aureus* (MRSA).

MATERIALS AND METHODS



RESULTS



CONCLUSIONS AND PERSPECTIVES

- ❖ *G. mellonella* is a well-established implant model to test different metal K-Wires with various coatings.
- ❖ The implantation did not show any toxic effects or impairment in the growth phases of the larvae.
- ❖ From the survival phenotypes, HyProtect coating significantly prevented the death of the larvae from implant-associated infections.
- ❖ Further, bacterial load from explant K-Wire and in larval tissue showed a significant reduction in bacterial burden (~99%) in the larvae that were implanted with HyProtect-coated K-Wires.
- ❖ SEM analysis showed prevention of bacterial colonization on the HyProtect-coated K-wires.
- ❖ This study shows that *G. mellonella* is an excellent model to study implant-associated infections as well as to screen antimicrobial compounds or coatings.

Dr. Gopala Mannala
Experimental Trauma Surgery,
Department of Trauma Surgery,
University Hospital Regensburg,
Franz-Josef-Strauss-Allee 11,
93 051 Regensburg, Germany
gopala-krishna.mannala@ukr.de

